Large Displays

FEMA ELECTRÓNICA

# Series BDF

## Large Displays for serial ASCII code

BDF-xx-S Repeater for serial ASCII code

*IDEAL SOLUTION for reading ASCII messages at long distances, addressable units controlled through standard protocols RS232, RS485, RS422, ... Very strong housing and electrically protected units, designed for all type of industrial applications.*

USER'S MANUAL
(1277R01)

# Model S

## Large displays for serial ASCII code

The BDF series of large displays for Serial ASCII signals is a standard ASCII code repeater, accepting messages in the most common protocols in industry (RS232, RS485, RS422, TTL, ...). The transmission baud rate is selectable and the units can be addressed independently.

It allows display of numerical characters with and without decimal point, and a selection of other characters («A», «b», «C», ...) easily displayed and recognized within a 7 segment led.

Several units can be connected to the same data bus and be controlled independently. Up to 32 different addresses can be configured and address «0» allows the instrument to read and display all the data transmitted on the bus.

The mechanical of the BDF instruments is a very strong and sturdy aluminium housing anodized in black color, for panel mount, and for wall mount as an option. The front lens is antir-reflexive and is firmly inserted on the aluminium profile with a rubber gasket around, providing IP65 protection on the front.

The signal wires are connected to plug-in screw clamps for higher security of the connections, accessible at the rear side of the instrument. The power is connected to a 3 terminal plug (2 power connections and 1 earth) containing an integrated protection fuse and an additional fuse as spare part.

## Order reference

| | Size | Model | Power | Color | Others | Protocol |
|---|---|---|---|---|---|---|
| **BDF** - | **24** - | **S** - | **0** - | **R** - | **---** | **RS485** |
| | -24<br>-44<br>-26<br>-46 | -S | -0 (230 Vac)<br>-1 (115 Vac)<br>-6 (24 Vdc isolated) | -Red<br>-Green<br>(check for availability) | -65 *(IP65)** <br>*-(empty)* | RS485<br>RS232<br>... |

* the IP65 option uses a completely different type of housing from the indicated in this documentation. Check the BDF IP65 housing documentation for more information.

## Sizes

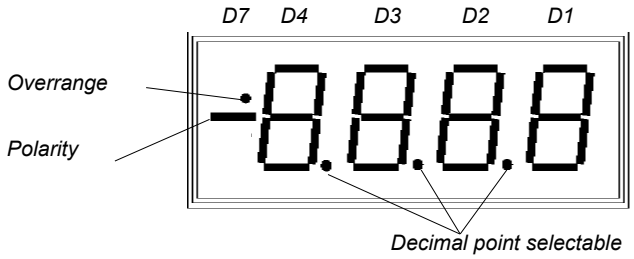
**SIZE BDF-24 -** Instrument with 4 digits digit 57mm height (2,3'')

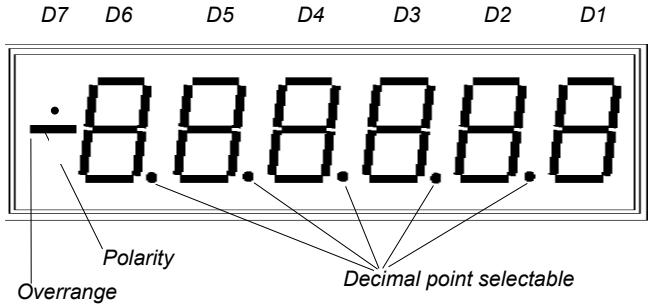
**SIZE BDF-44 -** Instrument with 4 digits digit 100 mm height (4,0'')

**SIZE BDF-26 .-** Instrument with 6 digits 57mm digit height

**SIZE BDF-46 .-** Instrument with 6 digits 100mm digit height

## Front view



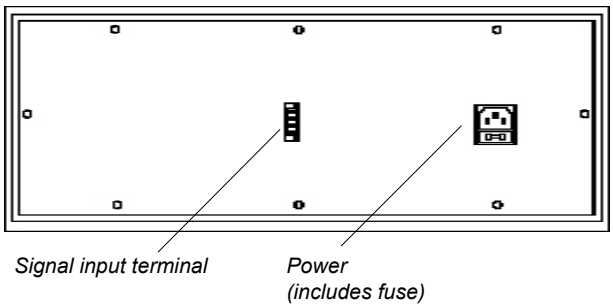

The instruments from the BDF Series are available in 4 and 6 digit format. All digits are led 7 segment type, with decimal point selectable.

**POLARITY AND OVERRANGE SYMBOLS**

Digit *«D7»* controls the polarity segment («-») and the over-range point («.»). The polarity segment activates when D7 is a character with central segment active («H», «4», «6», ...). The overrange point activates when *«D7»* is a character with upper segment active («0», «7», ...). If *«D7»* contains both central and upper segments («8», «P», ...) both the overrange and the polarity will light.

***Note**. - Units with 4 digits must receive also digits «D5», «D6» and «D7» to activate Polarity and/or Overrange.*

## Rear view




## General specifications

DISPLAY
- 4 or 6 digits in red color
- 7 segment Led
- reading from -9999 to 9999 in 4 digits
- reading from -999999 to 999999 in 6 digits
- decimal point selectable
- digit 57 mm (2,3") in BDF-24 and BDF-26
- digit 100 mm (4,0") in BDF-44 and BDF-46
- antirreflexive front filter
- IP65 front protection

ENVIRONMENTAL DATA
- Working Temp. 0/+50ºC (32/122 ºF)
- Storage Temp. -20/+85°C (-4/185ºF)
- Rel. Humidity 0 to 85% non condensated

HOUSING
- extruded aluminium
- anodized in black color
- for panel mount (optional wall mount)

POWER SUPPLY
- standard 230 Vac 50/60 Hz
- (optional 115 Vac 50/60 Hz)
- (optional 24 Vdc isolated)

CONSUMPTION
- 6 VA in series BDF-24 and BDF-26
- 12 VA in series BDF-44 and BDF-46

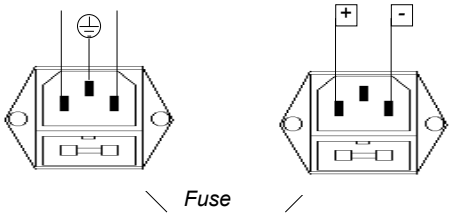
## Power supply connections

The power connector allows one terminal for earth and two power terminals. Internal fuse is integrated on the connector and an additional fuse is available as a spare part. The value of the fuses depends on the power supply, and is according to rule IEC127/2

230 Vac - 200 mA fuse time-lag
115 Vac - 400 mA fuse time-lag
24 Vdc - 350 mA fuse fast

*Powered*
*230 Vac (115 Vac optional)*

*Powered*
*24 Vdc Isolated*



## Input signal

The input signal type is selected with internal jumpers. If not otherwise indicated, the default configuration is

RS232
mode STROBE
1200 BPS
8 BITS NO PARITY
ADDRESS «0»

Note - the instrument does not need HANDSHAKE and will accept data in continuous mode

**SIGNAL RS232 (Bipolar ±15 Vdc)**

| | |
|---|---|
| Input impedance | >12 KOhms |
| Level «1» | >3 Vdc (Bit Start) |
| Level «0» | <-3 Vdc (Bit Stop) |
| Open line | on wait |
| Maximum levels | ±15 Vdc |

**SIGNAL RS422 / RS485 (differential)**

| | |
|---|---|
| Input impedance | >12 KOhms |
| Trigger level | < ±0,2 Vdc (internal load) |
| Hysteresis | 70mV typical |
| Maximum differential input | ±12Vdc |
| Maximum levels | de +12 a -7 Vdc |
| Terminator | 121 Ohms (selectable) |

**SIGNAL TTL**

| | |
|---|---|
| Input impedance | >12 KOhms |
| Level «1» | >2Vdc (Bit Stop) |
| Level «0» | <0,8 Vdc (Bit Start) |
| Maximum levels | de +12 a -7 Vdc |

**SIGNAL RS423 (Bipolar ±5 Vdc)**

| | |
|---|---|
| Input impedance | >12 KOhms |
| Level «1» | >0,5 Vdc (Bit Start) |
| Level «0» | <0 Vdc (Bit Stop) |
| Open line | on wait |
| Maximum levels | de ±7 Vdc |

**SIGNAL LOOP 2mA**

| | |
|---|---|
| Level «1» | >1,6 mA (Bit Start) |
| Level «0» | <0,2 mA (Bit Stop) |
| Levels reversible by internal jumpers | |
| Voltage drop | max. 1 Vdc a 2mA |
| Maximum current on the loop | 0,5 A |

**SIGNAL LOOP 20 mA**

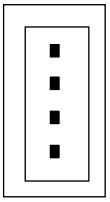
| | |
|---|---|
| Level «1» | >16 mA (Bit Start) |
| Level «0» | <2 mA (Bit Stop) |
| Voltage drop | max. 1 Vdc at 2mA |
| Maximum current on the loop | 0,5 A |

**LOOP RECEIVER 2mA or 20 mA ±20%**

| | |
|---|---|
| Input Impedance | >12 KOhms |
| Power | 5V open circuit voltage |
| Conformity | 3V at 2mA or 20 mA |

## Connections

| | *Pin 1* | *Pin 2* | *Pin 3* |
|---|---|---|---|
| RS232 ±15 V | Input | +5 V | Common |
| RS422/RS485 | Signal B | Signal A | Common |
| RS423 ±5 V | Input | +5 V | Common |
| 2 mA y 20 mA Loop | | | |
| Internal powered | Loop - | Loop + | NC |
| External powered | Loop + | NC | Loop |
| TTL levels | +5 V | Input | Common |



1 Signal B
2 Signal A
3 Common
4 ------

***Note** - Pin 3 can be connected to the ground of the system*

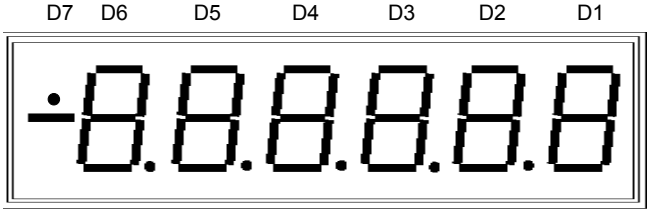
## Power start-up

When connecting the power supply to the instrument, the first message to appear on display is information on the current configuration of the unit. This message will disappear in 3 seconds, and the display will read «-------». The instrument remains «hearing» for new data coming through the line.

| | | | |
|---|---|---|---|
| D7 | Without information | | |
| D6 | Number of bits | «7» or «8» | |
| D5 | Parity | «E» | parity even |
| | | «o» | parity odd |
| | | «n» | without parity |
| | | «I» | parity ignored |
| D4 | Mode | «F» | mode shift |
| | | «r» | mode strobe |
| D3 | Reception | «L» | rec. state correct |
| | | «H» | rec. state not-correct |

Note.- take into consideration that a RS485 type can be tested as correct reception status although the polarity of the cables being inverted.

| | | |
|---|---|---|
| D2 | Address | character from «1» to «O» |
| D1 | Speed | number from «0» to «7» |



## Modes SHIFT and STROBE

**GENERAL WORKING MODE** - the character received is placed in the internal buffer, at the least significant position (*«D1»*) and moves all existing characters in the buffer to the left. Character *«D7»* is lost, and is substituted by character at *«D6»*. New characters arriving will be placed on *«D1»* and all other existing characters will be moved to the left.

**MODE «STROBE»** .- The characters stored in the buffer are loaded on display when a «CR» character is received.

**MODE «SHIFT»** .- The characters stored in the buffer are always being displayed.

***Note** - if working on «SHIFT» mode a «CR» character is received, the next character received will clean both the buffer and the display and will place the character received on display «D1»*

***Note** .- Characters which can not be ASCII displayed, will not be displayed on the instrument. Instruments with 4 digits still have «D5» and «D6» in the internal buffer, although only «D1», «D2», «D3», «D4» and «D7» are displayed.*

## Addressing

**ADDRESS**.- Address for instruments BDF Serial are selected with internal minidips *(see section 8)*. Possible addresses are 1 to 31 (total of 31 different addresses). The instrument will receive all data transmitted on the line, but will only display data which has the byte address the same as his address. Address «0» is a SNIFFER function, which will make the instrument to display all data from all addresses which are transmitted on the line.

***Note** .- The instrument with address 0 will display the address byte as a standard ASCII code.*

## Data structure

**DATA STRUCTURE** .- The structure of the data to receive once the unit is «hearing», is the following :

1.- Reception of character «ETX»
*(or character «XOFF»)*
2.- Reception of character «STX»
*(or character «XON»)*
3.- Reception of address of the instrument
*(address from «0» to «31»)*
4.- Reception of DATA characters
5.- Reception of character «ETX»
*(or character «XOFF»)*

***Note** .- An «ETX» character (or «XOFF» character) is sent before starting the first message in order to clean the internal buffer. (The «ETX» character first loads the buffer values on display and then cleans the buffer)*

***Note** .- If working on STX/ETX mode, the «ETX» character already includes the «CR» character and its functionality is the same in «SHIFT» mode and in «STROBE» mode.*

***Note** .- If working on XON/XOFF mode, the «XOFF» character does not include the «CR» character. If working in «STROBE» mode a «CR» character is needed to load on display the buffer data.*

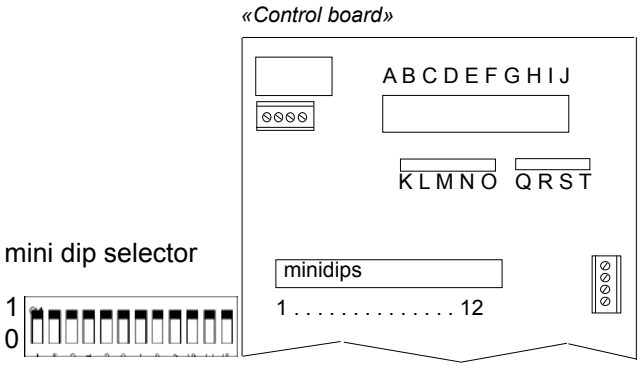
**MESSAGE FORMAT**

| *STX* | *Address* | *Data* | *ETX* |
|---|---|---|---|
| *1 byte* | *1 byte* | *n bytes* | *1 byte* |

| *XON* | *Address* | *Data* | *CR* | *XOFF* |
|---|---|---|---|---|
| *1 byte* | *1 byte* | *n bytes* | *1 byte* | *1 byte* |

# Configuration - Internal jumpers and dips

On the *«Control Board»* (accessible through the rear side cover) are placed the jumpers and minidips to configure the instrument (parity, signal type, ...)




**Parity and Number of Bits** (Jumpers R,S,T)

| | | |
|---|---|---|
| 7 bits | Jumper R | Open |
| 8 bits | Jumper R | Closed |
| Parity Even | Jumper S | Closed |
| | Jumper T | Open |
| Parity Odd | Jumper S | Open |
| | Jumper T | Closed |
| Parity Ignored | Jumper S | Closed |
| | Jumper T | Closed |

Note .- Setting Jumpers R, S and T to open configures «8 BITS WITHOUT Parity»

**Watchdog function** (Jumper Q)

| | | |
|---|---|---|
| Watchdog Active | Jumper Q | Open |
| Watchdog Inactive | Jumper Q | Closed |

**Control of brightness** (dip1,dip2)

| | |
|---|---|
| Brightness 100% | 1 1 |
| Brightness 75% | 1 0 |
| Brightness 50% | 0 1 |
| Brightness 25% | 0 0 |

Nota - Dip 3 always set to «0»

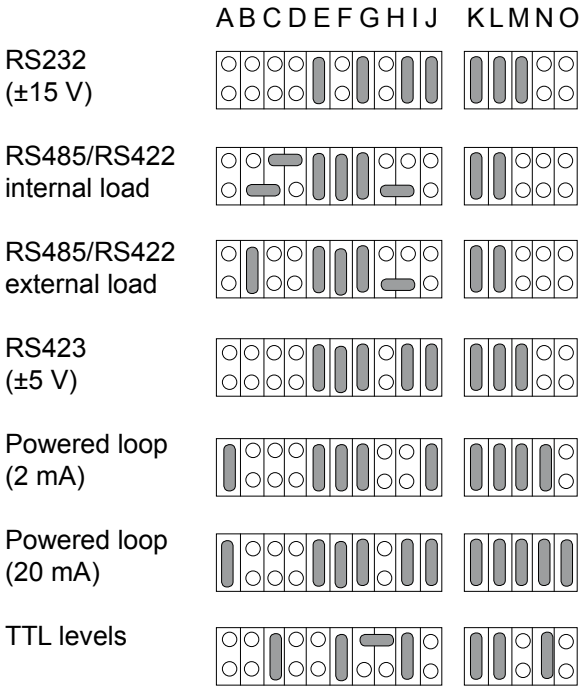
**Working mode** (dip4)

| | |
|---|---|
| SHIFT | 0 |
| STROBE | 1 |

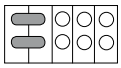
**Speed** (dip5, dip6, dip7)

| | |
|---|---|
| 19200 bps | 1 1 1 |
| 9600 bps | 1 1 0 |
| 4800 bps | 1 0 1 |
| 2400 bps | 1 0 0 |
| 1200 bps | 0 1 1 |
| 600 bps | 0 1 0 |
| 300 bps | 0 0 1 |
| 150 bps | 0 0 0 |

**Input signal** Jumpers A...J y K...O


A B C D E F G H I J
K L M N O
RS232 (±15 V)
RS485/RS422 internal load
RS485/RS422 external load
RS423 (±5 V)
Powered loop (2 mA)
Powered loop (20 mA)
TTL levels

Note - logical levels for signals 2 mA, 20 mA, RS423 and RS232 can be inverted by placing jumpers K and L in horizontal position



**Address** Dips 8, 9, 10, 11,12

| D8 ..D12 | @ | HEX | D8 ..D12 | @ | HEX |
|---|---|---|---|---|---|
| 0 0 0 0 0 | 0 | 30H | 1 0 0 0 0 | 16 | 40H |
| 0 0 0 0 1 | 1 | 31H | 1 0 0 0 1 | 17 | 41H |
| 0 0 0 1 0 | 2 | 32H | 1 0 0 1 0 | 18 | 42H |
| 0 0 0 1 1 | 3 | 33H | 1 0 0 1 1 | 19 | 43H |
| 0 0 1 0 0 | 4 | 34H | 1 0 1 0 0 | 20 | 44H |
| 0 0 1 0 1 | 5 | 35H | 1 0 1 0 1 | 21 | 45H |
| 0 0 1 1 0 | 6 | 36H | 1 0 1 1 0 | 22 | 46H |
| 0 0 1 1 1 | 7 | 37H | 1 0 1 1 1 | 23 | 47H |
| 0 1 0 0 0 | 8 | 38H | 1 1 0 0 0 | 24 | 48H |
| 0 1 0 0 1 | 9 | 39H | 1 1 0 0 1 | 25 | 49H |
| 0 1 0 1 0 | 10 | 3AH | 1 1 0 1 0 | 26 | 4AH |
| 0 1 0 1 1 | 11 | 3BH | 1 1 0 1 1 | 27 | 4BH |
| 0 1 1 0 0 | 12 | 3CH | 1 1 1 0 0 | 28 | 4CH |
| 0 1 1 0 1 | 13 | 3DH | 1 1 1 0 1 | 29 | 4DH |
| 0 1 1 1 0 | 14 | 3EH | 1 1 1 1 0 | 30 | 4EH |
| 0 1 1 1 1 | 15 | 3FH | 1 1 1 1 1 | 31 | 4FH |

## Accepted ASCII codes

| ASCII | HEX | (Keyboard) | |
|---|---|---|---|
| «STX» | 02H | (Ctrl B) | Activates the «Hearing» state in the instrument. Next character will be the instrument address (if not, the unit will be set to «Not-Hearing» state) |
| «ETX» | 03H | (Ctrl C) | Activates the «Not-Hearing» state in the instrument. Loads on display the buffer data and cleans the buffer |
| «EOT» | 04H | (Ctrl D) | Activates the BS4505 ASCII mode |
| «ACK» | 06H | | Last character displays in flashing mode (2 flash per second) |
| «FF» | 0CH | (Ctrl L) | Cleans the display and the internal buffer |
| «CR» | 0DH | (Ctrl M) | Carriage Return |
| «XON» | 11H | (Ctrl Q) | Same as «STX» |
| «DC2» | 12H | (Ctrl R) | Display brightness at 25% |
| «XOFF» | 13H | (Ctrl S) | Activates the «Not-Hearing» state of the instrument and cleans the buffer (without loading on dispay) |
| «DC4» | 14H | (Ctrl T) | Display brightness at 100% |
| «CAN» | 18H | (Ctrl X) | Display brightness at 50% |
| «ESC» | 1BH | (Esc) | Restarts the instrument |
| «SPACE» | 20H | (Espacio) | Inserts blank space |
| «+» | 2BH | (+) | Inserts character «+» |
| «-» | 2DH | (-) | Inserts character «-» |
| «.» | 2EH | (.) | Activates the decimal point of the last received character |

## ASCII code and displayed symbol

| | | |
|---|---|---|
| 0 | 30H | |
| 1 | 31H | |
| 2 | 32H | |
| 3 | 33H | |
| 4 | 34H | |
| 5 | 35H |  |
| 6 | 36H | |
| 7 | 37H | |
| 8 | 38H | |
| 9 | 39H | |
| : | 3AH | |
| ; | 3BH | |
| < | 3CH | |
| = | 3DH | |
| > | 3EH | |
| ? | 3FH | |
| @ | 40H | BLANK |
| A | 41H | |
| B | 42H | |
| C | 43H | |
| D | 44H | |
| E | 45H | |
| F | 46H | |
| G | 47H | |
| H | 48H | |
| I | 49H | |
| J | 4AH | |
| K | 4BH | |
| L | 4CH | |
| M | 4DH | |
| N | 4EH | |
| O | 4FH | |
| P | 50H |  |
| Q | 51H |  |
| R | 52H | |
| S | 53H |  |
| T | 54H |  |
| U | 55H | |
| V | 56H | |
| W | 57H | |
| X | 58H | |
| Y | 59H | |
| Z | 5AH | |
| [ | 5BH | |
| \ | 5CH | |
| ] | 5DH | |
| ^ | 5EH | |
| - | 5FH | |

Note - instrument in «Not Hearing» state can only be reactivated to «Hearing» state with codes 02 («STX»), 11 («XON»), 04 («EOT») and 1B («ESC»)

## Watchdog function

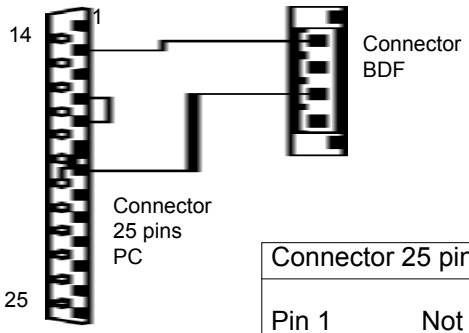
Function «WATCHDOG» lights the «-------» middle bars on display, when detects that not valid messages are being received.

In «STROBE» mode, the «WATCHDOG» function activates the «-------» when 5 seconds have passed since the last correct message received. A message is correct when the last characters are Ctrl-C («ETX»), Ctrl-M («CR») or Ctrl-L («FF»).

In «SHIFT» mode, the «WATCHDOG» function activates the «-------» when 5 seconds have passed since the last correct character received. Correct characters are : Ctrl-C («ETX»), Ctrl-M («CR»), Ctrl-L Decimal Point («2E»), Flash («06»), " - " («2D»), " + " («2B»), Space («20») and any other character with HEX code from «30H» up to «5FH».

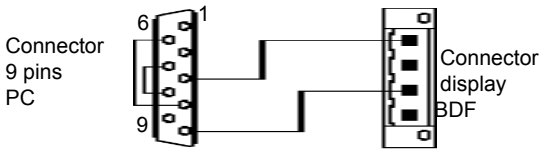
## Connection to a PC

Connecting a BDF-xx-S as a remote display receiving data from a PC with 25 pins SUB-D connector.




| Connector 25 pins | |
|---|---|
| Pin 1 | Not Connected |
| Pin 2 | TXD |
| Pin 3 | Not Connected |
| Pin 4 | RTS |
| Pin 5 | CTS |
| Pin 6 | DSR |
| Pin 7 | GND signal |
| Pin 8/19 | Not Connected |
| Pin 20 | DTR |
| Pin 21/25 | Not Connected |

Connecting a BDF-xx-S as a remote display receiving data from a PC with 9 pins SUB-D connector.




| Connector 9 pins | |
|---|---|
| Pin 1 | Not Connected |
| Pin 2 | Not Connected |
| Pin 3 | TXD |
| Pin 4 | DTR |
| Pin 5 | GND signal |
| Pin 6 | DSR |
| Pin 7 | RTS |
| Pin 8 | CTS |
| Pin 9 | Not Connected |

# Examples of code

### STROBE with STX/ETX

```
/*  FEMA ELECTRONICA, S.A
/*  Demo programm for
/*  BDF-XX-S connected TO PC*/
/*  Strobe mode with STX/ETX*/
/*  For Turbo C++ Borland V1.01*/
#include<bios.h> /*
#include<conio.h>
#include<stdio.h>
#define COM1      0/*
#define COM2      1/*
#define TRUE    1
#define FALSE   0
#define EVEN 0x18
#define ODD 0x10
#define NONE 0x0
#define BIT7 0x2
#define BIT8 0x3
#define STOP1 0x0
#define STOP2 0x4
#define BAUD300    0x40
#define BAUD600    0x60
#define BAUD1200  0x80
#define BAUD2400  0xA0
#define BAUD4800  0xC0
#define BAUD9600  0xE0
int main(void)
{
 int count,DONE=FALSE;
/*counter&end loop condition
 char dat1,men1[25];
/*temporary data and string*/
 ciscr();
/*Clear Screen*/
/*Initializing Host port*/
bioscomp(0,(BAUD9600 | BIT8 | NONE | STOP1),COM2);
/*open COM2 port*/
/*Initializing instrument*/
 bioscom(1,'\x3', COM1);
/*Start addressing (ETX, also XOFF)*/
*/Main loop of the programm*/
while(!DONE){ /*start transmmision loop*/
/*Read message introduced using the keyboard*/
 count=0
/*reading the string introduced using the keyboard*/
 gotoxy(10,3);
 printf("enter the mesage (0-7 characters)");
/*Until press Enter key*/
 do{
                dat1=getche();
                Men1[count]=dat1;
                count++;
                }while (dat1!='\x0d');
 men1[count]='\r';
/*Send the message and present it on the screen*/
 cirscr();
 {
 bioscom(1,'\x2',COM2);       /*Send STX*/
  gotoxy(12.10);
 printf("STX");
 bioscom(1,'0' , COM2);       /* Send address*/
 printf("0");
 count=0
/*Message Loop Transmmision*/
 while (men1[count]!='\r'){
/*Covert to capital letters to see the small letters*/
if (men1[count]<123 & men1[count]>96) men1[count]
=men1[count]-32;
*/Print on screen. Send character to port until carriage
return*/
printf("%c", men1[count]);
bioscom(1,men1[count],COM2);
count++;
            };
bioscom(1,'\x3',COM2);       /*Send ETX, End of message*/
printf("ETX");
  }
 }
return 0;
}
```

### STROBE with XON/XOFF

```
/* FEMA ELECTRONICA, S.A
/*  Demo programm for
/*  BDF-XX-S connected to PC*/
/*  Strobe mode with XON/XOFF   */
/*  Turbo "C++", Borland Version 1.01*/

#include<bios.h>       /*
#include<conio.h>
#include<stdio.h>
#define COM1      0      /*
#define COM2      1      /*
#define TRUE    1
#define FALSE   0
#define EVEN 0x18
#define ODD 0x10
#define NONE 0x0
#define BIT7 0x2
#define BIT8 0x3
#define STOP1 0x0
#define STOP2 0x4
#define BAUD300    0x40
#define BAUD600    0x60
#define BAUD1200  0x80
#define BAUD2400  0xA0
#define BAUD4800  0xC0
#define BAUD9600  0xE0
int main(void)
{
 int count,DONE=FALSE;     /*counter  & end loop condi-
tion
 char dat1,men1[25];    /*temporary data and string*/
 ciscr();                    /*Clear Screen*/
/*Initializing Host port*/
 bioscomp(0,(BAUD9600 | BIT8 | NONE |
STOP1),COM2);
 /*open COM2 port*/
/*Initializing instrument*/
 bioscom(1,'\x19', COM1);       /*Start addressing (XOFF)*/
*/Main loop of the programm*/
while(!DONE){            /*start transmmision loop*/
/*Read message introduced using the keyboard*/
 count=0
/*reading the string introduced using the keyboard*/
 gotoxy(10,3);
 printf("enter the mesage (0-7 characters)");
/*Until press Enter key*/
 do{
dat1=getche();
  Men1[count]=dat1;
 count++;
}while (dat1!='\x0d');
 men1[count]='\r';
/*Send the message and present it on the screen*/
cirscr();
{
  bioscom(1,'\x11',COM2);       /*Send XON*/
  gotoxy(12.10);
 printf("XON");
 bioscom(1,'0' , COM2);       /* Send address*/
 printf("0");
 count=0
/*Message Loop Transmmision*/
 while (men1[count]!='\r'){
/*Covert to capital letters to see the small letters*/
if (men1[count]<123 & men1[count]>96) men1[count]
=men1[count]-32;
*/Print on screen. Send character to port until carriage
return*/
printf("%c", men1[count]);
bioscom(1,men1[count],COM2);
count++;                                  }
bioscom(1,'\x0D',COM2);
/*Send 0D hex STROBE*/
printf("STROBE");
bioscom(1,'\x13',COM2);
/*Send XON, end of message*/
printf(XOFF);
}
 }
return 0;
}
```

### SHIFT with XON/XOFF

```
/*  FEMA ELECTRONICA, S,A
/*  Demo programm
/*  for BDF-XX-S connected to PC*/
/*  Shift mode with XON/XOFF  */
/*  For Turbo C++ Borland V1.01 */
#include<bios.h>       /*
#include<conio.h>
#include<stdio.h>
#define COM1      0      /*
#define COM2      1      /*
#define TRUE    1
#define FALSE   0
#define EVEN 0x18
#define ODD 0x10
#define NONE 0x0
#define BIT7 0x2
#define BIT8 0x3
#define STOP1 0x0
#define STOP2 0x4
#define BAUD300    0x40
#define BAUD600    0x60
#define BAUD1200  0x80
#define BAUD2400  0xA0
#define BAUD4800  0xC0
#define BAUD9600  0xE0
int main(void)
{
 int count,DONE=FALSE;
/*counter  & end loop condition
 char dat1,men1[25];
 /*temporary data and string*/
/*Initializing Host port*/
 bioscomp(0,(BAUD9600 | BIT8 | NONE |
STOP1),COM2);
/*open COM2 port*/
/*Initializing instrument*/
bioscom(1,'\x13', COM1);  /*Start addressing
(XOFF)*/
*/Main loop of the programm*/
 ciscr();    /*Clear Screen*/
while(!DONE){            /*start transmmision loop*/
/*Read message introduced using the keyboard*/
 count=0
/*reading the string introduced using the keyboard*/
 gotoxy(10,3);
 printf("enter the mesage (0-7 characters)");
/*Until press Enter key*/
 do{
dat1=getche();
  Men1[count]=dat1;
 count++;
}while (dat1!='\x0d');
 men1[count]='\r';
/*Send the message and present it on the screen*/
 cirscr();
 bioscom(1,'\x11',COM2);       /*Send XON*/
  gotoxy(12.10);
 printf("XON");
 bioscom(1,'0' , COM2);       /* Send address*/
 printf("0");
 count=0
/*Message Loop Transmmision*/
 while (men1[count]!='\r'){
/*Covert to capital letters to see the small letters*/
if (men1[count]<123 & men1[count]>96) men1[count]
=men1[count]-32;
*/Print on screen. Send character to port until car-
riage return*/
printf("%c", men1[count]);
bioscom(1,men1[count],COM2);
count++;
 bioscom(1,'\x13',COM2);       /*Send XOFF; End of
message*/
 printf("XOFF");
 }
return 0;
}
```

## Mechanical dimensions

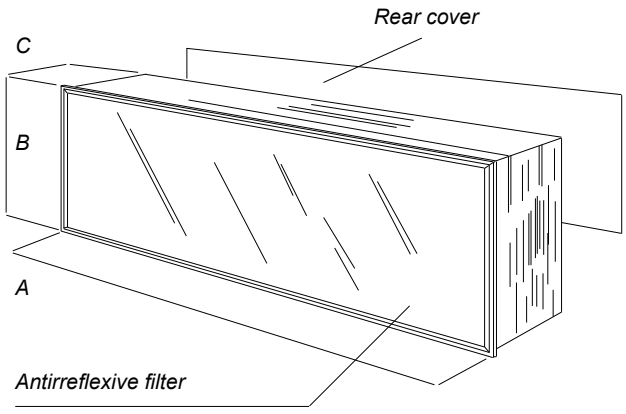
| Size 24 | A | B | C |
|---|---|---|---|
| 4 digits 57mm (2") | 264mm (10,40") | 120mm (4,75") | 112mm (4,41") |

| Size 44 | A | B | C |
|---|---|---|---|
| 4 digits 100mm (4") | 480mm (18,90") | 180mm (7,09") | 112mm (4,41") |

| Size 26 | A | B | C |
|---|---|---|---|
| 6 digits 57mm (2") | 384mm (15,12") | 120mm (4,75") | 112mm (4,41") |

| Size 46 | A | B | C |
|---|---|---|---|
| 6 digits 100mm (4") | 668mm (27,10") | 180mm (7,09") | 112mm (4,41") |

***Note** .- add 27mm to the «C» dimension for the power supply plug*




## Panel cut-out and weights

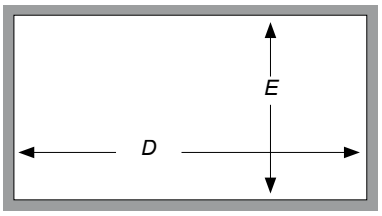
| Size 24 | D | E | weight |
|---|---|---|---|
| 4 digits 57mm (2") | 256mm (10,07") | 112mm (4,40") | 2.3 Kg (5 lbs) |

| Size 44 | D | E | weight |
|---|---|---|---|
| 4 digits 100mm (4") | 472mm (18,58") | 172mm (6,77") | 5.0 Kg (11 lbs) |

| Size 26 | D | E | weight |
|---|---|---|---|
| 6 digits 57mm (2") | 376mm (14,80") | 112mm (4,40") | 2.7 Kg (6 lbs) |

| Size 46 | D | E | weight |
|---|---|---|---|
| 6 digits 100mm (4") | 680mm (36,77") | 172mm (6,77") | 5.7 Kg (12,5 lbs) |

*PANEL CUT-OUT*

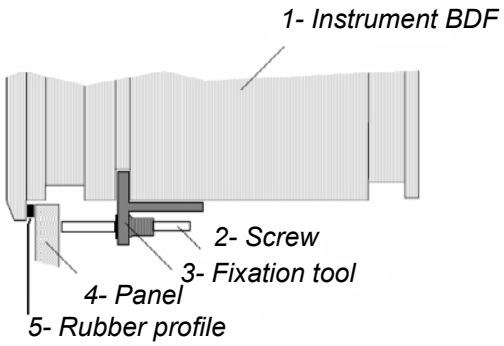



*Panel width*
*Max. 14 mm (0,55")*
*Min. 2,5 mm (0,10")*

## Panel installation

Introduce instrument «1» into the panel cut-out and place the fixation piece «3» on each side. Place screw «2» through fixation piece «3» until it presses the panel «4» and is firmly fixed.

Note - The front of the instrument is sealed IP65. To have the same level of protection between the panel and the instrument, place a rubber profile (squared or round) as indicated «5».



## Warranty

All instruments are warranted against all manufacturing defects for a period of 24 MONTHS from the shipment date. This warranty does not apply in case of misuse, accident or manipulation by non-authorized personnel. In case of malfunction get in contact with your local provider to arrange for repair. Within the warranty period and after examination by the manufacturer, the unit will be repaired or substituted when found to be defective. The scope of this warranty is limited to the repair cost of the instrument, not being the manufacturer eligible for responsibility on additional damages or costs.

## CE Declaration of conformity

Manufacturer FEMA ELECTRÓNICA, S.A.
Altimira 14 - Pol. Ind. Santiga
E08210 - Barberà del Vallès
BARCELONA - SPAIN
www.fema.es - info@fema.es

Series-Models BDF-24 y BDF-44
S

The manufacturer declares that the instruments indicated comply with the directives and rules indicated below.

Directive of electromagnetic compatibility 2004/108/CEE
Directive of low voltage 73/23/CEE

| | |
|---|---|
| Security rules | 61010-1 |
| Emission rules | 50081-2 |
| Immunity rules | 50082-1 |

*NOTE .- During an electromagnetic disturbance (10V/m) it is permitted a worst case error of 1% of the A/D range. The instrument will recover automatically its functionality when the disturbance stops, without need of the operator to reset or restart.*

Barberà del Vallès October 2009
Daniel Juncà - Quality Manager

## Precautions on installation

**INSTALLATION PRECAUTIONS**.- The installation and operation of this instrument must be done by qualified operators. This instrument DOES NOT have power switch and will start to operate as soon as the power supply is connected. The instrument has an internal protection fuse, according to IEC-127/2, and is located inside the power-supply connector. The values are

**Fuse 200 mA Time Lag (for 230 Vac power)**
**Fuse 400 mA Time Lag (for 115 Vac power)**
**Fuse 350 mA Fast (for 24 Vdc power)**

When the instrument is used to control machines or processes where the personnel or the process can be damaged, the appropriate security elements must be added to the system in order to protect the operator and / or the system.

**SAFETY PRESCRIPTIONS**.- This instrument has been designed and verified according to the UNE-20553 rules and is delivered in perfect conditions of operation. This manual contains the adequate information for the electrical installation. Before starting operations for connections, readjustment, substitution, maintenance, repair, etc, the instrument must be unplugged from the power supply. The instrument must be installed in places with good ventilation to avoid excessive heating, and far from sources of electrical noise or magnetic field generators, such as power relays, electrical motors, speed controls, etc... The instrument can not be installed in open places. Do not use until the installation is finished. The instrument is designed to be mounted on a metallic panel with the adequate protections. DO NOT clean the front lens with abrasive products (such as solvents, alcohol, etc) use a clean and water humid rag. Do not expose the instrument to excessive moisture. DO NOT operate the unit in the presence of flammable gases or fumes.

**EXCITATION VOLTAGE Vexc**.-
Instruments BDF-xx-32 and BDF-xx-36 supply an excitation voltage of 10 to 24 Vdc (50mA) to power transducers, available between terminals A and C. Do NOT connect these terminals to an external power supply, permanent damages may result on both instruments.

**POWER SUPPLY** .- Connect the Power Supply to the terminals indicated in this manual. Verify that the voltage and frequency of the power supply is according to the voltage and frequency values indicated in the label attached to the unit. DO NOT connect the instrument to power lines which are overloaded, or power lines with loads working in ON/OFF cycles, or with inductive loads.

**SIGNAL WIRING** .- Information to consider relating the wiring of the sensors, probes, transducers, etc. The wires can act as antennas and introduce electrical noise from the environment into the signal wires, specially if the wires are close to noise sources or electromagnetic sources. There are several rules generally known which should be taken into consideration for the wiring :

a.- DO NOT install impulse, control or signal wires together in the same conduits as the wires connected to power lines, connected to CC or AC engines, electromagnets, ...

b.- When using shielded wires, connect the shield to the common of the instrument, and leave not-connected the probe side

c.- The wires of impulse, control and signal should be placed in places far away from switches, transformers, control relays, etc...

**IN CASE OF FIRE**
1.- Disconnect the unit from the power supply.

2.- Give the alarm according to the local rules.
3.- Switch off all the air conditioning devices.
4.- Attack the fire with carbonic snow, do not use water in any case.

**WARNING : In closed areas do not use systems with vaporized liquids.**

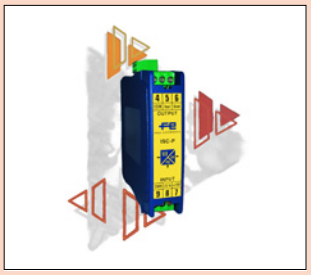
# other products

Panel Meters
Standard 96x48mm

Panel Meters
Small 72x36 mm

Panel Meters
Miniature 48x24 mm

Large Displays
60 & 100 mm digit



Signal Converters
& Isolators

Panel Meters
Standard 96x48mm

## www.fema.es

ELECTRONIC INSTRUMENTATION FOR INDUSTRY

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